



DEPARTMENT OF THE NAVY
NAVAL AIR SYSTEMS COMMAND
NAVAL AIR SYSTEMS COMMAND HEADQUARTERS
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IN REPLY REFER TO

NAVAIRINST 13120.1C
AIR-4.3.3
23 Dec 96

NAVAIR INSTRUCTION 13120.1C

From: Commander, Naval Air Systems Command

Subj: FIXED WING AIRCRAFT STRUCTURAL LIFE LIMITS

- Ref: (a) OPNAVINST 3110.11T, Policies and Peacetime Planning Factors Governing the Use of Naval Aircraft
(b) OPNAVINST 4790.2E, Naval Aviation Maintenance Program (NAMP)
(c) NAVAIRINST 13920.1F, Procedures for Submitting Flight Loads, Launch, and Landing Data for the Structural Appraisal of Fatigue Effects Program
(d) NAVAIRINST 4720.2A, Procedures for Reporting Structural Alterations on Aircraft for Fatigue Life Evaluation Program
(e) NAVAIRINST 4790.3B, Aeronautical Time Cycle Management Program
(f) NAVAIRINST 4790.20, Reliability Centered Maintenance (RCM) Program

- Encl: (1) Fixed Wing Aircraft Structural Life Limits for Flight, Catapult, and Arrestment
(2) Structural Life Limits Notes

1. Purpose. To provide policy and assign responsibilities to ensure continuing structural safety of fixed wing naval aircraft for flight, catapulting, and arresting operations. Enclosure (1) identifies structural life limits of airframes and structural components, and enclosure (2) provides notes pertaining to corresponding type/model/series (T/M/S) service life limits of enclosure (1).

2. Cancellation. This instruction supersedes NAVAIR Instruction 13120.1B of 09 March 1989. Since this is a major revision, changes have not been indicated.

3. Scope. This instruction applies to all Navy fixed wing aircraft. It requires implementation by all naval activities having responsibilities for ensuring continued safe aircraft operations. Maintaining and reporting records of aircraft usage, and strict adherence to time compliance requirements for the installation of structural modifications, is required for individual aircraft and components to attain their assigned service life limits. This instruction is closely related to



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Office of the Chief of Naval Operations (OPNAV) requirements delineated in references (a) and (b), and to other Naval Air Systems Command (NAVAIR) programs published in references (c) through (f). This instruction does not supersede, but clarifies and supplements, reference (a) emphasizing configuration relationships governing the OPNAV limitations. Additionally, this instruction does not supersede nor change the requirements of reference (e).

4. Background. The safety of aircraft operational usage initially is accommodated in the design of the aircraft by identifying and quantifying loads, and by analytically and experimentally evaluating the capability of the aircraft structure to withstand those loads. Structural life limits are established and maintained through the Aircraft Structural Life Surveillance (ASLS) program managed by NAVAIR, Air Vehicle Department (AIR-4.3). NAVAIR, as part of the Department of the Navy's streamlining strategy, will increase its reliance on, and acceptance of commercial methods, processes and procedures utilized by the Federal Aviation Administration (FAA) and the commercial aircraft industry to certify airworthiness and establish service life limits for commercial aircraft.

5. Information

a. Initially, aircraft structural life in flight hours, landings, catapult cycles, and arrestment cycles is derived from a contracted requirement and verified by full-scale structural fatigue testing, based on an anticipated operational usage. The structural life limits identified by these tests apply only to aircraft having the structural configuration of the article being tested. Subsequent structural design changes, variations in operational usage, and significant in-service material condition degradation may affect the structural life and require an appropriate change to the structural life limits assigned to the aircraft model.

b. Routine maintenance of aircraft is required at specific intervals to ensure that the assigned life is not degraded. Additionally, inspections and structural modifications may be required at specific times to ensure that individual aircraft are capable of safely attaining their assigned life. It is essential that these inspections and structural modifications, issued by technical directives, be carried out within time compliance requirements. This is particularly significant with respect to catapult and arrestment related structural components due to Navy

carrier operations, where catapult launches and arrested landings are extremely critical events, during which a structural failure will almost always be catastrophic and result in loss of the aircraft.

c. In order to maintain aircraft structural integrity and safety, as well as to achieve maximum economic use of the airframe, it is essential that accurate records of operational usage history, maintenance, modification, and configuration status be kept and accurately reported to the activities responsible for monitoring the usage of naval aircraft. Structural life limits are of little value if the usage history of airframes and critical components relative to those limits is unknown.

d. Structural life limits, as detailed in enclosure (1) and published in the Periodic Maintenance Information Cards (PMIC's), shall not be exceeded without the written authorization of NAVAIR (AIR-4.3). The automatic 10 percent extension, from reference (b), applicable to component overhaul intervals, is specifically not applicable to any structural life limit. The structural life limits provided in enclosure (1) are for use by NAVAIR, and its field activities, and aircraft controlling custodians as aircraft management information. These limits are to be published in each aircraft PMIC for use by aircraft reporting custodians. Changes to enclosure (1) limits will initially be implemented by a numbered Airframe Bulletin (AFB), Service Life Bulletin (SLB) or by Rapid Action Change (RAC) to ensure changes are reflected in aircraft logbooks as well as all applicable portions of the maintenance plan. The PMIC's are updated from enclosure (1) and unless modified by a more current AFB, SLB, RAC or Interim Rapid Action Change (IRAC), the limits listed in the PMIC's will take precedence. Disparities between enclosure (1), AFB, SLB, RAC limits, and other documentation should be referred to the originator of the other documentation and to NAVAIR ((AIR-4.3) and Logistics Management Department (AIR-3.1)) for resolution.

6. Life Management. Key elements of the structural life management of naval aircraft are:

a. A comprehensive ground test demonstration and documentation of structural life limits for the basic airframe structure and critical components in all modes of operation including flight, landing, catapult, and arrestment, as in enclosure (1) of this instruction.

b. Accurate and complete recording and reporting of operational usage loads and history data for individual aircraft.

23 Dec 96

c. Accurate and complete recording and reporting of routine maintenance, required structural modifications, and alterations for individual aircraft, and assurance that time compliance requirements for all structural modifications are met.

d. Accurate and complete tracking of all structural components as defined in paragraph 8 of this instruction.

e. The monitoring and reporting of structural fatigue life expended by individual naval aircraft under the Structural Appraisal of Fatigue Effects (SAFE) program.

f. Periodic reassessment and adjustment of the aircraft's structural service life under the Service Life Assessment Program, including the disassembly and inspection of major airframe structural components (e.g., wing center section, outer wing panel, fuselage, and empennage).

7. Policy. It is the policy of the Commander, Naval Air Systems Command that structural integrity of naval aircraft be provided and maintained throughout service life to ensure safety of fleet operations. Implementation will be in agreement with references (a) through (f) and this instruction.

8. Definition. For the purpose of this instruction, structure or structural component is defined as items within the airframe primary load path, failure of which, would cause loss of aircraft or aircrew.

9. Responsibilities

a. NAVAIR/Program Executive Officers (PEO's)

(1) Program Managers, Air (PMA's) will

(a) ensure contractual provisions for the demonstration of structural life commensurate with planned fleet usage are included in the procurement of naval aircraft and structural components;

(b) be the authority for establishing, modifying, and documenting structural life limits for those specific non-developmental, off-the-shelf commercial aircraft identified in enclosures (1) and (2) owned by the Department of the Navy; and

(c) ensure that each key element of structural life management as described in paragraph 6 of this instruction is accomplished.

(2) Assistant Program Managers, Systems and Engineering (APMSE's) will be responsible for ensuring that contractual provisions for the serialization of all primary load-bearing structural components, to permit usage history tracking, are included in the procurement of naval aircraft and spare or replacement structural components.

(3) Assistant Program Managers, Logistics (APML's) will

(a) ensure that all current life limited items in enclosure (1) are analyzed through the Reliability Centered Maintenance (RCM) program, per reference (f), using technical information, such as fatigue analysis and test results, provided by NAVAIR (AIR-4.3). Ensure that all NAVAIR (AIR-4.3) approved life limit values, are documented in PMIC's, Scheduled Depot Level Maintenance (SDLM) specifications, aircraft logbooks and other applicable maintenance plan documents. Provide preventive maintenance intervals, within structural life limits, based on age exploration results and RCM analysis. Ensure enclosure (1) life limit values are not altered without NAVAIR (AIR-4.3) written approval;

(b) plan for and acquire the logistics resources necessary to minimize the impact on readiness of aircraft reaching the structural life limits or technical directive time compliance requirements of enclosure (1). In conjunction with the APMSE, be responsible for ensuring contractual provisions for the serialization of structural components are included in the procurement of naval aircraft and spare or replacement structural components; and

(c) provide direction to the Aircraft Controlling Custodians (ACC) to ensure that enclosure (1) life limits are documented in the aircraft logbooks.

(4) Air Vehicle Department (AIR-4.3) will

(a) provide the technical criteria for the demonstration of structural life commensurate with planned fleet usage for all naval aircraft;

(b) be the authority for establishing and modifying structural life limits for aircraft airframes and structural components, including aircraft catapulting and arresting components, except for those non-developmental, off-the-shelf commercial aircraft specifically noted in enclosures (1) and (2) owned by the Department of the Navy;

23 Dec 96

(c) establish, maintain, monitor, and report flight, landing, catapult and arrestment usage history data, and structural Fatigue Life Expended (FLE) for individual naval aircraft under the SAFE program, except for those non-developmental, off-the-shelf commercial aircraft specifically noted in enclosures (1) and (2);

(d) review, on a continuing basis, authorized aircraft operating service lives issued by OPNAV, and recommend changes as appropriate; and

(e) provide the technical criteria for identification of structural components that require serialization.

(5) Logistics Support Department (AIR-3.6) will

(a) be responsible for monitoring and recommending changes to reference (b) to remove disparities and resolve conflicts between naval aircraft maintenance policies and strict adherence to structural life limits; and

(b) be responsible for recording the completion of modifications by responsible maintenance activities (Naval Aviation Depot's (NADEP's) and commercial contractors) to ensure that the time compliance requirements of the technical directives listed in enclosure (1) and applicable SLB's are met.

(6) Assistant Commander for Industrial Capabilities (AIR-6.0) will be responsible for ensuring the implementation of the maintenance recording and reporting provisions of this instruction by the Naval Aviation Depot Operations Center (NADOC) and by responsible maintenance activities (NADEP's and assigned commercial contractors).

b. Fleet Support Teams (FST's) will

(1) issue timely structural life limits of enclosure (1), subsequent AFB's, SLB's, and RAC's to aircraft custodians under their cognizance;

(2) maintain accurate configuration lists for all removable and interchangeable primary load-bearing structure and structural components utilized on aircraft under their cognizance; and

(3) establish and implement a serialization plan for interchangeable structure and structural components consistent with reference (e);

c. NADEP's will

(1) verify aircraft logbook records (OPNAV Form 4790/21A), usage history, and structural configuration of all aircraft inducted;

(2) forward copies of aircraft logbook records for each aircraft inducted to Naval Air Warfare Center Aircraft Division (NAWCAD) Code 4.3.3;

(3) utilize the component data in enclosure (1) to update appropriate logbook records and tracking forms;

(4) report any alterations to primary load-bearing airframe structure, listed in enclosure (1), to NAVAIR (AIR-4.3) and NAWCAD (Code 4.3.3) per reference (d); and

(5) maintain complete records, including logbook entries, of aircraft structural and material maintenance, modifications, and alterations performed.

d. ACC's will

(1) remain responsible for monitoring the FLE values published under the SAFE program; and

(2) schedule and monitor the completion of maintenance necessary to preclude aircraft under their control from exceeding any structural life limit.

e. Reporting Custodians will closely monitor, maintain, and report accurate records of individual aircraft usage per references (b) and (c).

f. NAWCAD (Code 4.3.3) will assist NAVAIR (AIR-4.3) in maintaining, monitoring, and reporting flight, landing, catapult and arrestment usage history data, and structural FLE for individual naval aircraft under the SAFE program.

g. NAVAIR Deputy Commander for Acquisition and Operations (AIR-1.0), NADOC, and ACC's will, for commercial contractors under their respective cognizance

(1) verify aircraft logbook records, usage history, and structural component configuration for all aircraft inducted at commercial sources;

(2) forward copies of aircraft logbook records to NAWCAD (Code 4.3.3) for each aircraft inducted;

(3) utilize the component data in enclosure (1) to update appropriate logbook records and tracking forms;

(4) report any alterations to primary load-bearing airframe structure, listed in enclosure (1), to NAVAIR (AIR-4.3) and NAWCAD (Code 4.3.3) per reference (d);

(5) maintain complete records, including logbook entries, of aircraft structural and material maintenance, modifications, and alterations performed; and

(6) include appropriate requirements in their contract to implement the requirements of this instruction.

10. Action

a. NAVAIR/PEO's

(1) PMA's will

(a) include contractual provisions for the demonstration of structural life commensurate with planned fleet usage in the procurement of naval aircraft, aircraft structural modifications, and structural components;

(b) include contractual provisions to ensure all engineering data and reports necessary to establish, monitor, and report the structural life of naval aircraft, aircraft structural modifications, and structural components are provided to AIR-4.3; and

(c) identify and document the structural life limits of the basic airframe and structural components, that require serialization and usage history tracking, for those specific non-developmental, off-the-shelf commercial aircraft identified in enclosures (1) and (2) owned by the Department of the Navy.

(2) APMSE's will

(a) ensure that contractual provisions for the serialization of all primary load-bearing structural components, to permit usage history tracking, are included in the procurement of naval aircraft and spare or replacement structural components; and

(b) ensure that all structural strength and fatigue analysis reports are provided to the FST's at the NADEP.

(3) APML's will

(a) review each formal revision of enclosure (1) and ensure that all changes are incorporated in PMIC's, SDLM specifications, and all other applicable maintenance documents;

(b) issue enclosure (1) structural life limits to the Aircraft Controlling Custodians;

(c) issue RAC's or IRAC's as necessary to implement changes in the applicable technical documents when newly determined or revised structural life limits are identified;

(d) ensure that technical directives are issued for structural modifications of naval aircraft within specified time compliance requirements;

(e) ensure that preventive maintenance intervals, within structural life limits, are supported by RCM analysis, Logistics Support Analysis (LSA), and documented in maintenance and logistic plans; and

(f) ensure implementation of the maintenance recording and reporting provisions of this instruction in all commercial modification contracts for aircraft under jurisdiction of reference (b) and contracted by NAVAIR Assistant Commander for Contracts (AIR-2.0).

(4) AIR-4.3 will

(a) identify and document in enclosure (1) the structural life limits of the basic airframe and structural components, that require serialization and usage history tracking, for all naval fixed wing aircraft, except for those non-developmental, off-the-shelf commercial aircraft specifically noted in enclosures (1) and (2) owned by the Department of the Navy;

(b) monitor and report flight, landing, catapult and arrestment usage history data, and structural FLE for individual naval aircraft under the SAFE program, except for those non-developmental, off-the-shelf commercial aircraft specifically noted in enclosures (1) and (2);

(c) sponsor and manage Service Life Assessment Programs (SLAP's) to periodically validate existing structural life limits or to establish rationale for modifying those limits under the ASLS program;

(d) provide APML's with written supplements to enclosure (1), detailing newly determined or revised structural life limits as they are identified, and assist the APML's in the preparation of AFB's, SLB's, or RAC's as necessary to implement changes in the applicable technical documents;

(e) issue formal revisions of enclosure (1) to operating and maintenance naval activities via the APML's and FST's at the NADEP's, incorporating all updated and revised structural life limits;

(f) forward to OPNAV (N88) via NAVAIR, Logistics Support Department (AIR-3.6), aircraft structural life limits and catapult and arrestment cycle limits annually for use in establishing the operating service life limits per reference (a); and

(g) provide APML's structural life limit adjustments resulting from repair or alterations of individual aircraft.

(5) AIR-3.6 will

(a) monitor and recommend changes to reference (b) as necessary to remove disparities and resolve conflicts between naval aircraft maintenance policies and strict adherence to structural life limits;

(b) ensure an adequate system is established by all responsible maintenance activities to maintain and report complete records of aircraft modifications, alterations, and structural and material maintenance;

(c) record, with the assistance of the Naval Aviation Maintenance Office (NAMO), the completion of modifications by responsible maintenance activities (NADEP's and commercial contractors) to assure that the time compliance requirements of the technical directives in enclosure (1) and applicable SLB's are met; and

(d) under the Technical Directives Status Accounting (TDSA) program, ensure the TDSA database and records of compliance with technical directives listed in enclosure (1) and applicable SLB's are readily available to NAWCAD (Code 4.3.3) for use in the SAFE program.

(6) AIR-1.0, AIR-6.0, and ACC's will, for activities under their cognizance

(a) ensure that all responsible maintenance activities (NADEP's and commercial contractors) maintain complete records of aircraft modifications, alterations, and structural and material maintenance. This also includes appropriate logbook entries for equivalent organizational level maintenance they perform;

(b) direct all responsible maintenance activities to ensure aircraft logbook records (OPNAV Form 4790/21A), Scheduled Removal Component (SRC) cards (OPNAV Form 4790/28A), and Structural Life Limit forms (OPNAV Form 4790/142) of all aircraft inducted for processing are consistent with data in enclosure (1);

(c) direct all maintenance activities performing Aircraft Service Period Adjustment (ASPA) evaluations or SDLM's to forward copies of aircraft logbook records (OPNAV Form 4790/21A, Monthly Flight Summary) to NAWCAD (Code 4.3.3) for each aircraft inducted for SDLM;

(d) include appropriate requirements in their contracts with commercial SDLM contractors to assure implementation of this instruction; and

(e) direct all ASPA inspectors to screen aircraft logbooks to ensure that no structural life limited component will exceed limits before next ASPA or SDLM.

b. FST's will

(1) review the data in enclosure (1) and recommend changes, based on in-service engineering considerations, to NAVAIR (AIR-4.3);

(2) establish procedures to maintain configuration lists for all structural components listed in enclosure (1) utilized on aircraft under their cognizance. Assemblies of components which are not authorized for disassembly by organizational or intermediate maintenance activities may be tracked as assemblies provided they are limited to the lowest component service life remaining and the individual components usage history records are maintained internally by the NADEP's;

(3) establish procedures for serializing and tracking interchangeable structural components per reference (e);

(4) submit, to NAVAIR (AIR-4.3), copies of local engineering directives and field team dispositions for unique modifications/repairs to airframes and structural components that may affect fatigue life, including limitations that will not be exceeded;

(5) utilize the component data in enclosure (1), AFB's, SLB's, and RAC's to update and revise the applicable PMIC's and appropriate tracking forms identified by aircraft T/M/S, per reference (e); and

(6) issue notification via naval message (MINIMIZE considered) to the ACC, the responsible maintenance activity, NADOC, and NAVAIR (APML and AIR-4.3) for disposition of aircraft when it appears that time compliance requirements for structural modifications may not be met.

c. NADEP's will

(1) verify from aircraft logbooks the usage history, structural configuration, and technical directive incorporation status of all aircraft inducted. Liaison with previous Reporting Custodians to rectify discrepancies as required. Report unresolved discrepancies by standard naval message per reference (b) to NAVAIR (AIR-3.1 and AIR-4.3) with information copies to ACC's and Reporting Custodians;

(2) forward copies of aircraft logbook records, OPNAV Form 4790/21A, to NAWCAD (Code 4.3.3) for each aircraft inducted; and

(3) report any alterations to primary load-bearing airframe structure, listed in enclosure (1), to NAVAIR (AIR-4.3) and NAWCAD (Code 4.3.3) per reference (d) instructions (Report Symbol NAVAIR 4720-1 applies).

d. ACC's will

(1) establish procedures to closely monitor aircraft over 90 percent FLE per the SAFE report or over 90 percent of the structural life limits of enclosure (1); and

(2) include a review of aircraft logbooks and report submittal procedures in the routine inspections performed on Reporting Custodians for correct implementation of this instruction.

e. Reporting Custodians will

(1) utilize the airframe and depot removable item data in enclosure (1) as published in the applicable PMIC to create, update, and revise aircraft logbook records and appropriate tracking forms;

(2) monitor closely and maintain accurate records of individual aircraft usage, and notify the ACC that prompt maintenance action is required when any aircraft structural life limit has been or will be exceeded;

(3) furnish flight, landing, catapult, and arrestment records for individual aircraft, utilizing NAVAIR Form 13920/1, Flight Loads/Launch/Landing Data, per reference (c), by the first day of each calendar month. Reports will be submitted to NAWCAD (Code 4.3.3) for all naval fixed wing and rotary wing aircraft, including those without the flight loads data recorders (Report Symbol NAVAIR 13920-1 applies). Data required by NAVAIR Form 13920/1 may be submitted utilizing Naval Aviation Logistics Command Management Information System (NALCOMIS) for Organizational Maintenance Activities (OMA) at the time of NALCOMIS OMA installation;

(4) ensure all usage records reported are consistent with aircraft logbook records, OPNAV Form 4790/21A; and

(5) report any alterations to primary load-bearing airframe structure, listed in enclosure (1), to NAVAIR (AIR-4.3) and NAWCAD (Code 4.3.3) in accordance with reference (d) instructions (Report Symbol NAVAIR 4720-1 applies).

f. NAWCAD (Code 4.3.3) will

(1) provide technical support to AIR-4.3 to establish, maintain, monitor, and report flight, landing, catapult, arrestment, and structural FLE data, consistent with logbook data submitted on NAVAIR Form 13920/1, for individual naval aircraft under the SAFE program;

(2) issue notification for action to responsible activities when NAVAIR Form 13920/1 is not submitted;

(3) review flight, landing, catapult, and arrestment usage history data to identify individual aircraft that are within 10 percent of the life limits contained in enclosure (1). This does not preclude the primary responsibility of operating and maintenance activities to monitor individual aircraft usage history data relative to the life limits contained in enclosure (1) as defined in paragraphs 9.b., 9.c., and 9.d. of this instruction;

(4) collate and analyze usage history data and structural modification or alteration data to identify fleet trends and establish structural FLE for individual aircraft annually under the SAFE program; and

(5) provide technical support to NAVAIR (AIR-4.3) relative to the collection, analysis, and reporting of individual aircraft usage history data.

g. AIR-1.0, NADOC, and ACC's will, for commercial contractors under their cognizance

(1) verify from aircraft logbooks the usage history, structural configuration, and technical directive incorporation status of all aircraft inducted. Liaison with previous reporting custodians to rectify discrepancies as required. Report unresolved discrepancies by standard naval message to NAVAIR (AIR-3.1 and AIR-4.3) with information copies to ACC's and reporting custodians;

(2) forward copies of aircraft logbook records, OPNAV Form 4790/21A, to NAWCAD (Code 4.3.3) for each aircraft inducted; and

(3) report any alterations to primary load-bearing airframe structure, listed in enclosure (1), to NAVAIR (AIR-4.3) and NAWCAD (Code 4.3.3) per reference (d) instructions (Report Symbol NAVAIR 4720-1 applies).


11. Reports

a. Report Symbol NAVAIR 4720-1, Structural Alteration Report, assigned by reference (d), applies to the reporting requirements of paragraphs 10.c.(4), and 10.e.(5), and 10.g.(3).

b. Report Symbol NAVAIR 13920-1, Flight Loads/Launch/Landing Data Report, assigned by reference (c), applies to the reporting requirements of paragraph 10.e.(3).

12. Forms. NAVAIR 13920/1 (1-95), Flight Loads/Launch/Landing Data, S/N 0102-LF-994-2100, OPNAV 4790/21A, Monthly Flight Summary, S/N 0107-LF-047-9107, OPNAV 4790/28A, Scheduled Removal Component Card, S/N 0107-LF-047-9142, and OPNAV 4790/142, Structural Life Limits, S/N 0107-LF-002-6700, shall be ordered per CD-ROM NAVSUP 600 (NLL).

13. Review. AIR-4.3.3 shall review annually the contents herein and provide recommendations for changes and deletions to the Commander.


J. A. LOCKARD

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23 Dec 96

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FIXED WING AIRCRAFT STRUCTURAL LIFE LIMITS FOR FLIGHT, CATAPULT, AND ARRESTMENT

1. Introduction. The following table lists structural life limits for all naval fixed wing aircraft, airframe changes (AFCs) and accessory changes (AYCs) required to reach basic airframe limits. The table also lists the structural components with structural life limits different, usually lower, than the basic airframe limits. Disparities between this instruction, AFBs, IRACs and PMICs should be referred to the CFA. An explanation of the tables presentation format follows for clarity:

<u>Column</u>	<u>Description of Information</u>
T/M/S	All Type/Model/Series of aircraft for which corresponding limits apply.
FLIGHT HOURS	Basic structural life limit of the airframe in flight hours.
CATAPULT CYCLES	Basic structural life limit of the airframe in catapult cycles.
ARRESTMENT CYCLES	Basic structural life limit of the airframe in arrestment cycles.
FLE	Fatigue life expended. Values presented in terms of percent (%).
LIFE LIMITS COMPLIANCE	Structural life limit of corresponding component(s) or time compliance of AFC(s)/AYC(s) required to reach basic airframe service life limit. Five categories of compliance are used: Flight Hours, Catapult Cycles, Arrestment Cycles, Landings, and Calendar (for limits based solely on calendar days/months/years in service).
COMPONENTS/AFC's	Structural components with life limits different than the basic airframe limit. Also lists AFCs/AYCs required to reach basic airframe limits.
NOTES	Additional information pertaining to corresponding T/M/S service life. See Enclosure (2).

2. In general, one time incorporation of AFCs/AYCs extends service life to basic airframe limit, while components must be tracked to corresponding limits and replaced as many times as required. An ASTERISK (*) identifies SRC items. All other limits reflect airframe (including AFC/AYC time compliances) or depot removable items which are to be recorded on the aircraft logbook page, form OPNAV 4790/142.

<u>T/M/S</u>	<u>FLIGHT HOURS</u>	<u>CATAPULT CYCLES</u>	<u>ARREST CYCLES</u>	<u>LIFE LIMITS COMPLIANCE</u>	<u>COMPONENTS/AFC's</u>	<u>NOTES</u>
NTA-4F, NTA-4J TA-4J	12,000	2,000	1,200			1,2
A-6E	5,500	1,875	2,000			1,2
EA-6B	10,000	4,500	4,500			1,2
EA-7L, TA-7C	8,000	3,000	3,000	2,000 HOURS	*UHT Actuator Barrel (P/N CV21-601022)	1
				800 CAT. CYCLES	*Launch Bar (P/N 215-24060-9-12) following rework IAW NADEP Jacksonville LES 352-084-83	
				1,700 CAT. CYCLES	*NLG Drag Link (P/N 215-24071, -24072)	
				2,100 CAT. CYCLES	Launch Collar (P/N 215-24065)	
				2,200 CAT. CYCLES	NLG Shock Strut Piston (P/N 215-24033-1)	
				3,000 CAT. CYCLES	*NLG Drag Link (P/N 218-24071, -24072)	
					*NLG Outer Housing (P/N 218-24404-101)	
					*NLG Inner Cylinder (P/N 218-24405-105)	
				2,200 ARR. CYCLES	*Hook Shank (P/N CV 29-664100)	
				2,400 ARR. CYCLES	*Arresting Gear Attach Lugs (P/N 215-40410)	
AV-8B, TAV-8B NAV-8B, YAV-8B	6,000	NA	NA	2,100 HOURS	*Vert. Tail Attach Fig. (P/N 75A337207-20001) [a]	1
				3,450 HOURS	*Inbd. Pylon Fwd. Wing Attach Fig. (P/N 75A732316-2001, -2002) [a]	
				5,345 HOURS	*Intermed. Pylon Access Door/Upper Torque Beam (P/N 75A732316-2001, -2002) [a]	
				5,410 LANDINGS	*MLG Cylinder Assy. (P/N 20088720, 200887101) [a]	
				7,000 LANDINGS	*MLG Assy. (less Cylinder) (P/N 20088704)	
					*NLG Assy. (P/N 200886003)	
					*Wing Landing Gear (P/N 75A430800-1003)	
					Effectivity	
					[a] BUNO 161396-161399 only	

NOTES

COMPONENTS/AFC's

LIFE LIMITS
COMPLIANCE

ARREST
CYCLES

CATAPULT
CYCLES

FLIGHT
HOURS

T/M/S

AV-8B [b]	2,000	NA	NA	Effectivity [b] BUNO 164129 only (Radar Forward Fuselage)	1
AV-8C	3,000	NA	NA	AFC 193, AFC 196 Center Spar Web Mod (LES CP70-13-M-4905)	
C-2A(R)	10,000	3,000	3,000	E-2C AFC-378, Part II, Outer Wing Panel (P/N 123W10003-503, S/N A1-G77-022); (P/N 123W10003-507, S/N A1-G77-012); (P/N 123W10003-508, S/N A1-G77-012) Outer Wing Panel (P/N 123W10003-601, S/N A1-G77-012); (P/N 123W10003-602, S/N A1-G77-012) Outer Wing Panel (P/N 123W10003-601, -602) Nacelle (P/N 123W60014-1) Wing Center Section (P/N 123W10002-601) Stabilizer (P/N 123CS40001-601) Fin Assy. (P/N 123CS40010-601, -602)	1
				NLG Plate Lock (P/N CPT 9936F43) NLG Receiver Assy (P/N 128L10074-601) NLG Holdback Assy (P/N 128L10076-601) Launch Bar Fig (P/N 123LM40583-601) Launch Bar Pin (P/N 123L60003-601) NLG Shock Strut Assy (P/N CPT 2042-100) NLG Drag Brace Assy (P/N CPT 2042-172)	
				Stinger Assy (P/N 123CVM10048-1, -401); (P/N 123CVM10513-1); P/N 620137-1) Arresting Gear Pin Assy (P/N 123CVM10046-401) Arresting Gear Truss Assy (P/N 123LM40055-601)	1
C-130F, C-130T, KC-130F	30,000	NA	NA		
DC-130A	15,000	NA	NA		1

23 Dec 96

<u>T/M/S</u>	<u>FLIGHT HOURS</u>	<u>CATAPULT CYCLES</u>	<u>ARREST CYCLES</u>	<u>LIFE LIMITS COMPLIANCE</u>	<u>COMPONENTS/AFC's</u>	<u>NOTES</u>
LC-130F	30,000	NA	NA			1,10
KC-130R, KC-130T, LC-130R	25,000	NA	NA			1,10
TC-130G, TC-130Q	20,000	NA	NA			1
E-2C, E-2C PLUS, TE-2C PLUS	10,000	3,000	3,000	3,500 HOURS 5,100 HOURS 6,000 HOURS 7,500 HOURS 10,000 HOURS 11,450 HOURS	Outer Wing Panel (P/N 123W10003-503, -504, -507, -508, -531, -532); (P/N 123W10003-601, -602) Engine Aft Isolator Mount Bolt (P/N LM211-64) E-2C AFC-378 Part II, Outer Wing Panel (P/N 123W10003-503, -504) [b]; (P/N 123W52100-1, -2) [b] Outer Wing Panel (P/N 123W10003-509, -510) [a]; (P/N 123W52100-1, -2) [a]; (P/N 123W10003-537, -538) [a] Nacelle, Horizontal Stabilizer, Outboard Fin (P/N 123CS50001-3) AFC-353, Part I, Wing Center Section (P/N 123W10002) [c]	1
				550 CAT. CYCLES 1,000 CAT. CYCLES 2,500 CAT. CYCLES 2,750 CAT. CYCLES	Launch Bar (P/N 123LM10189-1,-3) [a] Launch Bar (P/N 123LM10189-1,-3) [b] Launch Bar Pin (P/N 123LM10094-1) Receiver Assy. (P/N 128L10074-501,-503) Hold Back Assy. (P/N 123LM10086-5) Arm Assy (P/N 123LM10085-11; P/N 123LM10086-5) NLG Drag Brace (P/N 123SCL5003-1; P/N 2578490-1) NLG Upper Drag Brace (P/N 2579053) NLG Lower Drag Brace (P/N 2579068) NLG Drag Brace (P/N 123CSL5003-3; P/N 2581765) NLG Upper Drag Brace Assy (P/N 2581763) NLG Lower Drag Brace Assy (P/N 2581791)	

<u>T/M/S</u>	<u>FLIGHT HOURS</u>	<u>CATAPULT CYCLES</u>	<u>ARREST CYCLES</u>	<u>LIFE LIMITS COMPLIANCE</u>	<u>COMPONENTS/AFC's</u>	<u>NOTES</u>
E-2C, E-2C PLUS, TE-2C PLUS				3,500 CAT. CYCLES	NLG Shock Strut Assy (P/N 123SCL5002-1; P/N 2578489-1) NLG Shock Strut Outer Cylinder Assy (P/N 2579032) NLG Shock Strut Caster Barrel Assy (P/N 2579040) NLG Shock Strut Assy (P/N 123SCL5002-3; P/N 2581760) NLG Shock Strut Outer Cylinder Assy (P/N 2581756) NLG Shock Strut Caster Barrel Assy (P/N 2581761) Launch Bar Assy (P/N 123LM10189-15)	
				4,000 CAT. CYCLES	Stinger Assy. (P/N 123CVM10048-1, -401; P/N 123CVM10513-1; P/N 620137-1) Pin Assy (P/N 123CVM10046-401) Arrest Gear Truss Assy (P/N 123CVM10004-1, -501)	
				500 ARR. CYCLES	Horizontal Stabilizer-to-Fuselage Attach Fig, Link Assy (P/N 123CSM10033)	
				3,000 ARR. CYCLES		
				15,600 LANDINGS		
					Effectivity: [a] BUNO 163029 and subsequent [b] BUNO 163028 and prior [c] BUNO 158638-162615 only	

23 Dec 96

NOTES

<u>T/M/S</u>	<u>FLIGHT HOURS</u>	<u>CATAPULT CYCLES</u>	<u>ARREST CYCLES</u>	<u>LIFE LIMITS COMPLIANCE</u>	<u>COMPONENTS/AFC's</u>	<u>NOTES</u>
F-4N, RF-4B, YF-4J	8,000	Note 3	2,000	2,700 HOURS 4,500 HOURS	AFC 459 AFC 561 (J Series Only) AFC 562 (N Series Only) AFC 606 (B Series Only)	1,3
				750 CAT. CYCLES 850 CAT. CYCLES 1,200 CAT. CYCLES	AFC 442 Hook Attach Fig. (P/N 32-11121-25, -26) AFC 593 Holdback Fig. Assy. (P/N 32-32149-5) Bolt, Holdback Fig. (P/N 32-32318-3) Holdback Arm (P/N 32-32573-1) Bolt, Holdback Arm (P/N NAS 1310-18DW) Bushing, Holdback Arm (P/N 32-32289-5) Catapult Hooks (P/N 32-11437-3, -4)	
				1,700 CAT. CYCLES	*Hook Shank (P/N 32-84076)	1,4
F-4S	1,800	Notes 3,4	2,000	2,000 ARR. CYCLES Note 4	AFC XXX (ECP 1077)	
				750 CAT. CYCLES 850 CAT. CYCLES 1,200 CAT. CYCLES	AFC 442 Hook Attach Fig. (P/N 32-11121-25, -26) AFC 593 Holdback Fig. Assy. (P/N 32-32149-5) Bolt, Holdback Fig. (P/N 32-32318-3) Holdback Arm (P/N 32-32573-1) Bolt, Holdback Arm (P/N NAS 1310-18DW) Bushing, Holdback Arm (P/N 32-32289-5) Catapult Hooks (P/N 32-11437-3, -4)	
				1,700 CAT. CYCLES		
				2,000 ARR. CYCLES	Hook Shank (P/N 32-84076)	
F-5E, F-5F	Note 16	NA	NA			1,2

<u>T/M/S</u>	<u>FLIGHT HOURS</u>	<u>CATAPULT CYCLES</u>	<u>ARREST CYCLES</u>	<u>LIFE LIMITS COMPLIANCE</u>	<u>COMPONENTS/AFC's</u>	<u>NOTES</u>
F-14A, NF-14A	Note 1	2,890	2,890			1,2
F-14B, NF-14B, F-14D, NF-14D	Notes 1,14	2,890	2,890			1,2
FA-18A (160775-161251)	2,000	2,000	2,000			1,2,15
FA-18B (160781-161249)	2,000	2,000	2,000			1,2,15
FA-18A, NFA-18A (161354-161718)	3,000	2,000	2,000			1,2
FA-18B (161353-161714)	3,000	2,000	2,000			1,2
FA-18A, NFA-18A (161720-163175)	6,000	2,000	2,000			1,2
FA-18B (161719-163123)	6,000	2,000	2,000			1,2
FA-18C, NFA-18C (163427 and up)	6,000	2,000	2,000			1,2
FA-18D, NFA-18D (163434 and up)	6,000	2,000	2,000			1,2

23 Dec 96

<u>T/M/S</u>	<u>FLIGHT HOURS</u>	<u>CATAPULT CYCLES</u>	<u>ARREST CYCLES</u>	<u>LIFE LIMITS COMPLIANCE</u>	<u>COMPONENTS/AFC's</u>	<u>NOTES</u>
FA-18E (165164-165165)	6,000	0	0			1,16
FA-18E (165167 and up)	6,000	2,250	2,250			1,16
FA-18F (165166 and up)	6,000	2,250	2,250			1,16
E-6A	NA	NA	NA			13
EP-3E	15,000	NA	NA			1
EP-3J	20,000	NA	NA			1
P-3A, P-3B, P-3C NP-3B, NP-3C, NP-3D, RP-3A, TP-3A, UP-3A, UP-3B, VP-3A	20,000	NA	NA	6 YEARS	NLG Assy. (P/N 534957-1) MLG Assy. (P/N 534956-1)	1
S-3A, S-3B, ES-3A	13,000	3,000	3,000	2,000 CAT. CYCLES	Holdback Fig. Link (P/N 1284863-101, -105) Axle Beam (P/N 1284610-101, -105, -109)	1
				700 ARR. CYCLES	Arr. Hook Shank (P/N 1285511-107)	
US-3A	20,000	3,000	3,000	2,000 CAT. CYCLES	Holdback Fig. Link (P/N 1284863-101, -105) Axle Beam (P/N 1284610-101, -105, -109)	1,7
				700 ARR. CYCLES	Arr. Hook Shank (P/N 1285511-107)	

23 Dec 96

<u>T/M/S</u>	<u>FLIGHT HOURS</u>	<u>CATAPULT CYCLES</u>	<u>ARREST CYCLES</u>	<u>LIFE LIMITS COMPLIANCE</u>	<u>COMPONENTS/AFC's</u>	<u>NOTES</u>
EA-3B, NTA-3B TA-3B	18,000	2,000	2,000	2,000 HOURS	Flap Hinge Fig. (P/N 5385548-1, -2, -501, -502); (P/N 5385549-1, -2); (P/N 5385550-1, -2)	5
				2,400 HOURS	Flap Hinge Fig. (P/N 5385548-503, -504); (P/N 5385549-501, -502); (P/N 5385550-501, -502)	
				3,000 HOURS	Fin Fold Fig. (P/N MDC 3274660)	
				4,000 HOURS	Flap Trunnion Assy. (P/N 3675567)	
				5,000 HOURS	AFC 438	
					AFC 477	
				300 CAT. CYCLES	Cat Hooks (P/N 3441424-501, -502)	
				400 CAT. CYCLES	Cat Hook Attach Fig. (P/N 3440802-1, -2)	
				450 CAT. CYCLES	Holdback Fig. (P/N 3441568)	
				600 CAT. CYCLES	Cat Hook Attach Fig. (P/N 3440802-501, -502, -503, -504)	
				750 CAT. CYCLES	Cat Hooks (P/N 3441424-503, -504)	
					(P/N 5549851-503, -504, -505, -506)	
				850 CAT. CYCLES	Holdback Fig. (P/N 3665564)	
				1,500 CAT. CYCLES	Holdback Fig. (P/N 517677-2, -3)	
					*Hook Shank (P/N 5381287-509, -511)	
				500 ARR. CYCLES	AFC 455	
				1,350 ARR. CYCLES		
				2,500 LANDINGS		
					*NLG Upper Retract Link (P/N 5381424-501, -503); (P/N 624040)	

23 Dec 96

NOTES

<u>T/M/S</u>	<u>FLIGHT HOURS</u>	<u>CATAPULT CYCLES</u>	<u>ARREST CYCLES</u>	<u>LIFE LIMITS COMPLIANCE</u>	<u>COMPONENTS/AFC's</u>	
ERA-3B, NRA-3B	18,000	1,375	2,000	2,000 HOURS	Flap Hinge Fig. (P/N 5385548-1, -2, -501, -502); (P/N 5385549-1, -2); (P/N 5385550-1, -2)	5
				2,400 HOURS	Flap Hinge Fig. (P/N 5385548-503, -504); (P/N 5385549-501, -502); (P/N 5385550-501, -502)	
				3,000 HOURS	Fin Fold Fig. (P/N MDC 3274660)	
				4,000 HOURS	Flap Trunnion Assy. (P/N 3675567)	
				5,000 HOURS	AFC 438 AFC 477	
				300 CAT. CYCLES	Cat Hooks (P/N 3441424-501, -502)	
				400 CAT. CYCLES	Cat Hook Attach Fig. (P/N 3440802-1, -2)	
				450 CAT. CYCLES	Holdback Fig. (P/N 3441568)	
				600 CAT. CYCLES	Cat Hook Attach Fig. (P/N 3440802-501, -502, -503, -504)	
				750 CAT. CYCLES	Cat Hooks (P/N 3441424-503, -504) (P/N 5549851-503, -504, -505, -506)	
				850 CAT. CYCLES	Holdback Fig. (P/N 3665564)	
				1,500 CAT. CYCLES	Holdback Fig. (P/N 517677-2, -3)	
				500 ARR. CYCLES	Hook Shank (P/N 5381287-509, -511)	
				1,350 ARR. CYCLES	AFC 455	8
C-9B, DC-9	NA					8
C-20D, C-20G	NA					8
CT-39E, CT-39G, T-39D	NA					8
RC-12F, RC-12M, UC-12B, UC-12F, UC-12M	NA					8
TC-4C	NA					8

<u>T/M/S</u>	<u>FLIGHT HOURS</u>	<u>CATAPULT CYCLES</u>	<u>ARREST CYCLES</u>	<u>LIFE LIMITS COMPLIANCE</u>	<u>COMPONENTS/AFC's</u>	<u>NOTES</u>
TC-18F	NA					8
T-34C, NT-34C	NA					8
T-44A	NA					8
OV-10A, OV-10D	15,000	NA	NA			
T-2C	12,000	1,700	1,700	2,500 LANDINGS 32,000 LANDINGS	NLG Upper Retract Link (P/N 5381424-501, -503); (P/N 624040) MLG Cylinder (P/N 9755-J2-2)	1
T-38A	NA	NA	NA			9
T-45A	14,400	1,020	1,020			1
EC-24A	Unknown					8,11
C-28A	Unknown					11
NKC-135A	Unknown					13
NU-1B	Unknown					11
U-6A	Unknown					11
U-21A	Unknown					11
X-26A	Unknown					11
X-31A	Unknown					13
QF-4N	8,000	NA	NA			12

STRUCTURAL LIFE LIMITS NOTES

1. Certain aircraft fall under the Structural Appraisal of Fatigue Effects (SAFE) Program. The flight hour limits correspond to fatigue test article equivalent flight hours. Flight loads and usage data are collected and analyzed to permit determination of individual aircraft fatigue life expended (FLE) to date. FLE takes precedence over aircraft flight hours for scheduling maintenance and inspections and for determining airframe and component retirement. The following aircraft are included in the SAFE Program: TA-4J, NTA-4F, NTA-4J, A-6E, EA-6B, EA-7L, TA-7C, AV-8B, TAV-8B, NAV-8B, YAV-8B, C-2A, C-130F, C-130T, KC-130F, DC-130A, LC-130F, KC-130R, KC-130T, LC-130R, TC-130G, TC-130Q, E-2C, TE-2C, F-4N, RF-4B, YF-4J, F-4S, F-5E, F-5F, F-14A, NF-14A, F-14B, NF-14B, F-14D, NF-14D, FA-18A, FA-18B, FA-18C, FA-18D, FA-18E, FA-18F, NFA-18A, NFA-18C, NFA-18D, EP-3E, EP-3J, P-3A, P-3B, P-3C, NP-3B, NP-3C, NP-3D, RP-3A, TP-3A, UP-3A, UP-3B, VP-3A, S-3A, S-3B, ES-3A, US-3A, T-2C, and T-45A.
2. Detailed structural life limits and time compliance requirements for the basic airframe and critical components in all modes of operation including flight, landing, catapult and arrestment are contained in a numbered service life bulletin (SLB). These limits are to be published in each aircraft PMIC for use by aircraft reporting custodians. The PMIC is initially updated from the numbered SLB and unless modified by a more current SLB, the limits listed in the PMIC will take precedence.
3. For F-4 aircraft, retrofit of taperlok fasteners (AFC 459) increases flight hours from 2,700 to 4,500. F-4 basic airframe catapult life is 1,200. However, F-4 aircraft are prohibited from catapulting due to unknown usage history of holdback assembly components.
4. F-4S service life is tracked following conversion, regardless of pre-conversion usage. AFC XXX (ECP-1077), incorporating fatigue test identified modifications required to reach full life was canceled, effectively limiting F-4S aircraft to 50 percent of test demonstrated service life. Catapult and arrestment limits (1,200 and 2,000 respectively) are total on airframe since new.
5. For version A-3 aircraft, it is recommended that AFC 455 be installed as near to 1,000 arrestments as possible. Flight hour limit increased from 5,000 hours to 10,000 hours with incorporation of AFC 438 and AFC 477. For aircraft exceeding 5,000 flight hours without AFC 477, the intent of AFC 477 will be incorporated either by field team or at next SDLM. Extension beyond 10,000 hours limit requires a wing life inspection per AFB 194 at 800 hour intervals, and one-time incorporation of AFB 195. To increase flight hour limit to 14,000 hours and permit discontinuation of wing life inspections requires rework of F.S. 409 frame outer cap fastener holes per AFB 192 Part I, AFB 192 Part II, or AFB 194, and rework of center wing section access fastener holes at B.L. 18.8 per AFB 195. The increase in flight hour limit to 18,000 is contingent upon incorporation of AFC 508.
6. For E-2C and C-2A aircraft, pending outcome of fatigue test and teardown, inspections and modifications may be required to attain stated life limits.
7. Limited fleet US-3A data indicates a less fatigue damaging utilization than the S-3A and S-3B with a commensurate increase in life. Based on the available data, a fatigue life 20,000 flight hours has been assigned to the US-3A aircraft for planning purposes. Individual aircraft lives are determined under the SAFE Program.
8. C-9B, DC-9, C-20D/G, CT-39E/G, T-39D, RC-12F/M, UC-12B/F/M, TC-4C, T-34C, NT-34C, and T-44A are non-developmental, off-the-shelf commercial aircraft certified in accordance with Federal Aviation Administration (FAA) policies and procedures. Service life limits for these aircraft and their components are established and maintained by the cognizant Aircraft Program Manager Office in conjunction with the Original Equipment Manufacturer (OEM) and the FAA. Questions regarding service life limits for these should be referred to the cognizant Aircraft Program Manager Office.

23 Dec 96

9. The service life of each T-38A aircraft is dependent on wing configuration, past and present mission employment, results of continuing USAF T-38 Aircraft Structural Integrity Program, and material condition. All Navy T-38A aircraft have had updated wings installed.
10. Midterm inspections and rework applicable only for LC-130F/R aircraft that have been deployed to Antarctica since the last SDLM and are scheduled to be deployed to Antarctica prior to their next SDLM.
11. Miscellaneous station support aircraft have been obtained from other services of the Department of Defense or Agencies of the Government. In general, these aircraft are derivatives of non-developmental commercial aircraft and are maintained in accordance with FAA policies, procedures and directives. Service life related information are not available for the following aircraft: EC-24A, C-28A, NU-1B, U-6A, U-21A.
12. Target drone conversion aircraft (e.g. QF-4N) service life limits are the same as corresponding piloted aircraft (e.g. F-4N). Authorization may be granted for limited drone conversion use of aircraft with unknown service histories following in-depth CFA inspection.
13. Service life related information are not available for the following aircraft: E-6A, NKC-135A, X-26A, and X-31A.
14. F-14B retrofit and F-14D remanufacture aircraft FLE is estimated using F-14A usage rates for pre-conversion service time and F-14B/D usage rates for post-conversion service time.
15. Consult the aircraft logbook for individual catapult and arresting limits. Catapults and/or arrestments may be prohibited or the allowable cycles may be less than 2000.
16. FA-18E/F aircraft is under development as are expected service life limits.